

ABSTRACT

An on-column process by which various radioactive-fluorine-labeled compounds can be obtained in a high yield. The process comprises a step in which [¹⁸O] water containing [¹⁸F] fluoride ions is introduced into a column packed with an anion-exchange resin for labeled-compound synthesis to collect the [¹⁸F] fluoride ions, a step in which the column is dehydrated, and a step in which a substrate is introduced into the column to cause a displacement reaction between the [¹⁸F] fluoride ions collected in the column and a leaving group of the substrate to thereby obtain a radioactive-fluorine-labeled compound, wherein the step of passing carbon dioxide through the column is conducted between the resin column dehydration step and the substrate introduction step.